PULP & PAPER

March 1989

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This issue's focus on stock preparation and recycling is the first in a three-issue examination of papermaking. Forming will be covered in the April issue, and pressing and drying/coating will be covered in May. **(Photo courtesy of Jefferson Smurfit Corp.)**

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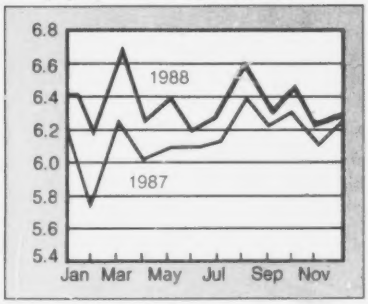
ABP

BPA

U.S. paper and board production



U.S. production of paper and paperboard totaled 6.3 million tons in December, down 0.2% from December 1987, according to the American Paper Institute. The December decline caps a year of gradually declining growth in the trend of production. The 0.2% drop marks the first year-over-year decline since December 1985. Thanks to strength at the beginning of the year, however, total production finished the year at a record 76.7 million tons, up 3.1% from 1987. This new yearly record is the third in a row and the fifth in the past six years, API noted.

Among major grades, printing and writing paper production rose 5.2% to 21.9 million tons in 1988. Recycled grades were strongest in the paperboard sector, reflecting strong boxboard demand. Overall, boxboard production for domestic use rose 3.3% in 1988 to 6.2 million tons; containerboard production for U.S. consumption was up 2.2% to 23.5 million tons.

Canadian newsprint shipments totaled 874,000 metric tons in December, down 1.6% from the previous year. Production totaled 9.9 million tons for the year, a gain of 1.1% over 1987. Woodpulp exports rose 2.5% in December to 779,000 tons, bringing shipments for the year to 8.2 million tons, up 1.2%. ■

	Latest month (000 short tons)		% change from year ago	Annualized year-to-date (000 short tons)	% change from year ago
PAPER & PAPERBOARD PRODUCTION[1]					
Newsprint	Dec.	512	2.6	5,982	2.4
Uncoated groundwood (s)	Dec.	122	9.9	1,598	7.6
Coated paper (s)	Dec.	583	-0.9	7,371	7.5
Uncoated free sheet (s)	Dec.	958	-0.1	11,356	3.5
Other printing/writing	Dec.	132	6.5	1,533	9.0
Total packaging and other paper (s)	Dec.	421	-2.5	5,198	2.5
Tissue	Dec.	450	0.2	5,480	3.4
Total paper	**Dec.**	**3,177**	**0.4**	**38,519**	**4.1**
Unbleached kraft paperboard	Dec.	1,636	-0.5	19,268	2.0
Semichemical medium	Dec.	478	6.5	5,708	1.9
Bleached paperboard	Dec.	381	-0.3	4,483	1.4
Recycled paperboard	Dec.	663	-6.6	8,771	3.1
Total paperboard	**Dec.**	**3,157**	**-0.8**	**38,230**	**2.1**
Total U.S. paper and paperboard output	**Dec.**	**6,334**	**-0.2**	**76,748**	**3.1**
PULP, WASTEPAPER & FIBER[2]					
Total U.S. woodpulp production	Nov.	4,967	3.2	60,994	2.8
Market pulp production	Nov.	684	2.1	8,391	4.0
Wastepaper consumption at paper/board mills	Nov.	1,569	1.0	18,930	3.2
Pulpwood consumption (cords)	Nov.	7,887	6.6	95,235	1.8
CONVERTED PRODUCTS STATISTICS[3]					
Corrugated box shipments (billion ft²)	Dec.	23.467	1.3	307.457[6]	3.2
Containerboard inventories at U.S. box plants and mills	Dec. 1	2,487	3.8		
INTERNATIONAL TRADE[2]					
U.S. paper imports (including products)	Nov.	1,048	-5.8	12,828	2.1
Imports of Canadian newsprint	Nov.	684	-6.0	8,471[6]	-1.9
U.S. paper exports (including products)	Nov.	440	10.6	5,531	7.0
Exports of unbleached kraft linerboard	Nov.	168	14.3	2,133	-2.6
Exports of woodpulp	Nov.	420	15.1	5,406	13.6
Norscan pulp inventories[4]	Dec. 31	666	-3.6		
Norscan pulp operating rates[4]	Nov.	97%	99%	91%	96%
CANADIAN STATISTICS[5] *(reported in metric tons)*					
Total newsprint shipments	Dec.	874	-1.6	9,867[6]	1.1
Operating rates	Dec.	98%	97%	99%	98%
Inventories held by U.S. consumers	Dec. 31	1,435	1.7		
Other paper/board shipments	Dec.	493	-5.4	6,620	3.7
Woodpulp shipments (export only)	Dec.	779	2.5	8,157	1.2
Operating rates	Dec.	88%	91%	95%	96%

1. American Paper Institute. 2. API, Bureau of Census, American Pulpwood Assn. 3. Fibre Box Assn., Paperboard Packaging Council. 4. North American/Scandinavian paper-grade market pulp. 5. Canadian Pulp & Paper Assn. 6. Not annualized. (s) = Shipments.

Coated free-sheet: Markets continue growth in high-end printing, publishing areas

Grade structure: Coated free-sheet contains 10% or less groundwood pulp, most commonly stone groundwood. The balance is chemical pulp. The highest-quality coated papers, Nos. 1 and 2, do not have any groundwood content, while Nos. 3 and 4 may or may not contain it. Slightly over half of all No. 4 paper is free-sheet.

Almost 86% of coated free-sheet paper is coated two side (C2S). Most of the 420,000-tpy of coated one-side (C1S) paper is free-sheet.

Basis weights for premium coated Nos. 1 and 2 are usually between 60 lb and 100 lb; Nos. 3 and 4 generally are 25 to 90 lb. About 40% of coated Nos. 3 and 4 fall below 60 lb.

Gloss is the most popular surface finish (85%), followed by dull, matte, and embossed. As measured on the Garner glossmeter, finishes are 45 or more for glossy, down to 25 for dull, and 20 or below for matte. No. 1 is 65% glossy and 25% dull, with a fraction matte and embossed; No. 2 is about 80% glossy and 16% dull; and No. 3 is 63% glossy, 33% matte, and 3% dull. Embossed represents less than 2% of any grade.

Approximately 85% to 90% of coated paper is shipped in rolls, but 10% to 15%, mostly higher-quality grades, is sheeted.

Production/capacity: Operating rates in 1988 were about 97%. U.S. coated free-sheet shipments rose to about 3.3 million tons, 8% above 1987.

Capacity increased about 7% in 1988. Additional tonnage was added by Midtec Paper Corp. in Kimberly, Wis., Westvaco Corp. in Luke, Md., and International Paper Co. in Corinth, N.Y. IP will add 100,000 tpy more at Corinth in 1989.

Canadian mills that make coated free-sheet include Abitibi-Price Inc. and Fraser Inc. Island Paper Mills Co., New Westminster, B.C., is planning to produce an unspecified amount of coated free-sheet with an off-machine coater by 1990, and Repap Enterprises Corp. Inc. will install a machine that can make either coated groundwood or free-sheet.

Outlook: Nos. 1, 2, and 3 grades will experience the strongest growth. No. 1, about 5.5% of the coated market, will continue to undergo excellent growth.

Producers such as Consolidated Papers Inc., Potlatch Corp., and Westvaco have introduced new premium or super-premium No. 1 grades that possess better reproduction qualities and higher prices than the established No. 1 papers. No. 2 grades are similar to No. 1 but with slightly lower quality and a wider basis-weight range. The grade will post some growth in "coffee table"-type magazines and books and especially in advertising brochures.

The largest market for coated No. 3 is for catalogs, which consume nearly 50% of all U.S. shipments, plus magazines, books, inserts, and direct mail. Growth is expected to be excellent. European producers have also become suppliers of Nos. 1 and 2 and the super-premium grades—about 8% of total demand.

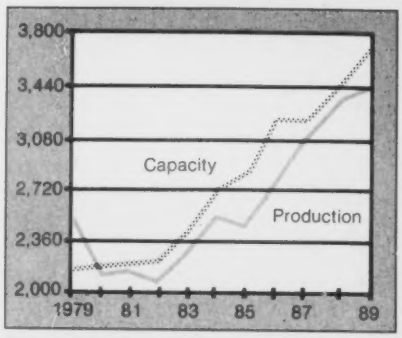
Shipments of coated No. 2 will increase, bringing its share of the coated market close to 5%. Growth for coated No. 3 will be 5.7% annually because it is produced mostly at integrated kraft mills, which have distinct cost advantages. For a minor price increase, end users can upgrade from No. 4, normally produced at mills that must purchase kraft pulp. In addition, the trend continues for No. 4 free-sheet demand to increase faster than No. 4 groundwood. C1S paper, primarily used for labels, is forecast to grow at only 0.7% annually.

Prices: Coated free-sheet prices rose in July 1988, and producers were expected to try another price hike by March or April 1989 due to a strong marketplace.

Typical historic pricing trends ($/short ton, average price for year) are as follows for 70-lb No. 1 sheets: 1984, $1,321; 1985, $1,375; 1986, $1,350; 1987, $1,410; 1988, 1509. For No. 3 rolls: 1984, $919; 1985, $980; 1986, $945; 1987, $980; 1988, $1,115.

Markets: Commercial printers use most of the coated free-sheet paper. Major end users are annual reports, catalogs, other advertising and promotional materials, some high-quality magazines, and some books.

SUPPLY/DEMAND (000 tons)



FORECAST (000 tons)

	1987	1988	1989e
Production[1]	3,085	3,338	3,435
Capacity[2]	3,229	3,456	3,731
Utilization rate	96.0	97.0	92.0
Imports	114	119	124
Exports	57	62	64
Apparent U.S. consumption	3,142	3,395	3,495
lb/capita	25.76	27.59	28.16
GNP ratio[3]	1.63	1.77	1.71

e = Estimate
1. *P&P* estimate.
2. American Paper Institute.
3. 1,000 tons/billion $ real GNP.

TOP U.S. PRODUCERS (000 tpy)

	Annual capacity	Market share (%)
1. Scott[1]	900	24.1
2. Westvaco	530[2]	14.2
3. Mead	415	11.1
4. Potlatch	311	8.3
5. Simpson	290[2,3]	7.8
6. Champion	265[4]	7.1
7. Consolidated	255[2]	6.8
8. Midtec	200[5]	5.4
9. International Paper	175e	4.7
10. James River	148	4.0

Market share of top five companies: **65.6%**

Market share of top ten companies: **93.5%**

Total U.S. capacity (1989): **3.731 million short tons**

1. S.D. Warren Div.
2. *P&P* estimate.
3. Includes Plainwell Paper Co. Inc.
4. 1988 production.
5. Division of Repap Enterprises Corp. Inc. Includes Canadian swing tonnage.

European beachhead. Consolidated-Bathurst's packaging operations in Europe would provide a good "beachhead" in that market at a time when the European Community is preparing for the elimination of tariff barriers among its members in 1992, noted Lynn. The company's Europa Carton subsidiary, based in Fed. Rep. Germany, has a recycled paperboard mill and about 11 corrugated box and folding carton plants. Consolidated-Bathurst also has tentative plans to build pulp and paper facilities in People's Rep. China, Argentina, and the U.S.S.R.

On the other hand, Consolidated-Bathurst would benefit from consolidating resources with a company that has traditionally been quick to raise funds and reinvest in its assets to improve its competitive position. A spokeswoman for the company said that it saw the acquisition as "friendly." Some observers wonder, though, if the corporate cultures will clash. Roger Stone said Canadian operations would continue to be based in Montreal, however, which should ease the transitional pangs. ■

SALES AND EARNINGS

U.S. pulp and paper industry profits sizzled during 1988

U.S. pulp and paper industry profits surged 42.8% last year on a 14.1% increase in sales, according to a *Pulp & Paper* survey of 26 companies. The high industry profits reflected strong demand that resulted in full capacity operation and price increases in most grade segments during 1988. The strong markets for pulp, paper, and paperboard helped to offset sliding demand and lower prices for wood products.

The surge in profits last year followed a jump in earnings of about 46% in 1987 and has been fueling a record boom in paper industry capital spending. Most chief executives were optimistic about prospects in 1989, with demand still strong and price increases already announced on some grades for the first quarter. Nevertheless, a few said they expected the rate of profit growth for their companies to slow in 1989.

International Paper Co. posted an 85% increase in earnings on a 21.8% increase in sales. Chairman and CEO John A. Georges attributes the strong showing to the company's white paper, market pulp, and packaging businesses. "For the second consecutive year, all our mills producing paper and paperboard operated at or near capacity," Georges said. He noted that IP is planning to invest more than $900 million this year to further modernize its facilities.

Champion International Corp. had an increase in profits of 19.4% to 456 million on sales of $5.1 billion thanks to improved results in domestic printing and writing paper, publication paper, market pulp, newsprint, and packaging. Income from operations in the company's wood products segment, which includes wood-related operations of Weldwood of Canada Ltd., fell due to a drop in prices for plywood and lumber. However, the effect of this decline was minimal since Champion restructured into primarily a pulp and paper company, according to chairman and CEO Andrew C. Sigler.

Great Northern Nekoosa Corp. enjoyed a 70.3% increase in earnings from 1987 on $3.6 billion in sales. "Excellent business conditions prevailed in our industry throughout the year," said GNN chairman William R. Laidig.

Paperboard profits surge. Profits of companies heavily involved in containerboard and bleached board increased dramatically. Union Camp Corp. reported that its net income for 1988 nearly doubled from the prior year, increasing 42.3% to $295 million. The company posted sales of $2.7 billion, an increase of 12.7% from 1987. Union Camp's paper mills operated at capacity throughout all of 1988, and chairman and CEO Gene Cartledge said, "This was an excellent year for each of our core businesses. Demand for paper and packaging products was strong, and selling prices improved significantly as the year progressed."

Jefferson Smurfit Corp.'s earnings surged 57.1% ahead of 1987's level to $145 million on sales of $1.3 billion. Strong performance by the company's 50%-owned Container Corp. of America affiliate helped to offset the strike at Smurfit Newsprint's two mills in Oregon, which started in early July last year. Equity in net income for CCA was $64.1 million in 1988 compared with $44.5 million the previous year.

Tissue profits strong. As tissue producers struggled with sharply rising fiber costs, James River Corp. led the first across-the-board tissue hike in seven years last spring. This hike helped the company boost earnings 22.7% on sales of $1.45 billion for the second quarter ended Oct. 31. And Kimberly-Clark Corp. enjoyed strong gains in sales and earnings, despite a year in which it was rumored to be the target of a takeover, causing stock prices to fluctuate. Still, Kimberly-Clark racked up $378.6 million in earnings—an increase of 16.4% over 1987.

Scott Paper Co. reported a 71.5% jump in earnings to $400 million, attributing part of the gain to the sale of Brunswick Pulp & Paper Co. and an after-tax gain from the company's share of earnings of international affiliates. Scott posted sales of $4.7 billion during 1988. Chairman and CEO Philip E. Lippincott said, "This represents the sixth year of continuous increases in primary earnings per share and the fifth consecutive year they have set all-time records."

Profits roll in white paper. Mead Corp. enjoyed an earnings improvement of 66.9% on sales of $4.5 billion, which chairman and CEO Burnell R. Roberts attributed to strong coated paper markets in all of 1988."We operated at near-capacity levels, backlogs were sizable, and net selling prices improved across our grade lines," Roberts said. Boise Cascade Corp. registered a 58.0% increase in earnings to $289 million for the year on sales of $4.1 billion. John B. Fery, chairman and CEO, foresees that 1989 will be another excellent year for the company.

Bowater Inc. continued its sales and earnings records last year, rolling up a 102% increase in profits over 1987. Sales for the year increased 16.7% to $1.4 billion. "With stable operating costs, strong pricing for our pulp and paper grades, and a favorable dollar exchange rate to support our export trade, all our plans made since we became public in 1984 bore fruit," said Anthony P. Gammie, chairman and CEO. Newsprint sales and earnings set records for the year despite a softening in advertising. Demand for the company's lightweight coated paper and bleached kraft market pulp remained strong throughout the year, with Bowater's second coated paper unit at Catawba, S.C., exceeding its design production levels throughout the entire year, according to Gammie.

Decreased wood products income. Weyerhaeuser Co.'s earnings for the year amounted to $564 million, an increase of 26.4% from 1987, despite lower results in its forest products and building materials business segments. The company attributes the strong showing to a 41% increase in operating earnings of its pulp and paper operations. Weyerhaeuser is expecting that markets will continue to strengthen during this year, and the outlook is better for both the real estate and the financial services businesses.

The driving force behind Georgia-Pacific Corp.'s record-breaking profits was strong domestic and export markets for pulp and linerboard and good domestic demand for uncoated freesheet paper, according to chairman and CEO T. Marshall Hahn Jr. Earnings for the year totaled $467 million, a 2% improvement over the 1987 level. Hahn said 1988 was a good year for the building products segment, even though income for that business was down from record levels in 1987. He is looking toward a strong showing in 1989, with new capacity resulting from the Brunswick Pulp & Paper mill that G-P acquired last August and expansions at several other G-P mills. ■

U.S. paper industry results.

	Full year ($000)			
Paper companies	**Sales 1988**	**% Change**	**Earnings 1988[1]**	**% Change**
Boise Cascade Corp.	$4,094,630	7.2%	$289,120	58.0%
Bowater Inc.	1,400,000	16.7	164,300	102.6
Champion International	5,100,000	10.9	456,000	19.4
Chesapeake Corp.	711,257	5.3	51,475	70.7
Consolidated Paper Corp.	896,804	20.7	149,883	56.5
Federal Paper Board Co.	1,116,941	8.9	143,300[2]	93.7
Gaylord Container Corp. (9/30)	671,000	53.2	41,900	117.1
Georgia-Pacific Corp.	9,509,000	10.5	467,900[2]	2.0
Great Northern Nekoosa Co.	3,588,100	38.6	341,700	70.3
International Paper Co.	9,500,000	21.8	754,000	85.3
Jefferson Smurfit Corp.	1,255,273	14.2	144,495	57.1
Kimberly-Clark Corp.	5,400,000	10.2	378,600	16.4
Louisiana-Pacific Corp.	1,799,400	8.8	135,200[2]	13.8
Mead Corp.	4,463,900	6.1	364,100[2]	66.9
Mosinee Paper Corp.	231,947	7.4	9,477	65.9
Pope & Talbot Inc.	514,980	20.9	31,944	13.6
Potlatch Corp.	1,084,000	9.3	112,400	28.3
Scott Paper Co.	4,726,400	14.7	400,900[2]	71.5
Sonoco Products Co.	1,599,751	21.9	96,277	56.6
Temple-Inland	1,750,000	9.4	195,000	37.9
Union Camp Corp.	2,660,918	12.7	295,146[2]	42.3
Westvaco Corp. (11/31)	2,133,889	12.1	200,434	37.1
Weyerhaeuser Co.	10,000,000	13.3	564,445[2]	26.4
Willamette Industries Inc.	1,716,021	19.9	161,087	32.8
Total	**$75,924,211**	**14.1%**	**$5,948,183**	**42.8%**

1. Income after taxes, from continuing operations, excluding most significant nonrecurring items in both years.
2. **Federal Paper**: Fourth-quarter and year earnings include one-time pretax gain of $7.2 million from a prior-year tax settlement and the net effect of a facilities restructuring program. **Georgia-Pacific:** Net earnings include a pretax gain of $66 million from liquidation of investments. **Louisiana-Pacific:** Restated from both years to reflect spinoff of Fibreboard in June 1988. **Mead:** 1988 Earnings reflect a loss of $11.4 million from discontinued operations. In the year-ago quarter, data reflects an extraordinary loss of $1.5 million. **Scott Paper:** Fourth quarter includes an after-tax gain from the company's share of earnings of International Equity Affiliates. 1987 net includes a $21.1-million after-tax gain from International Equity Affiliates and an $11-million one-time gain from a debt recapitalization program in Mexico. 1988 includes a pretax gain of $207.3 million from sale of Brunswick Pulp & Paper. **Union Camp:** 1987 results restated to reflect the consolidation of subsidiaries involved in real estate. **Weyerhaeuser:** Fourth-quarter and year results reflect consolidation costs.

EXPANSION/MODERNIZATION

Westbrook selects site for publication paper mill

Westbrook Wood Products has announced the selection of Klamath Falls, Ore., as the future site of a $300-million greenfield mill that will probably make newsprint or lightweight coated (LWC) paper. While still negotiating with potential partners, the company is going ahead with the permitting process and expects to have more details on the project in a few months.

In the meantime, Westbrook expects to reach a partnership agreement with at least one of the three paper companies it has been talking with in recent months and could possibly form a consortium with more than one other investor, it was noted. Two of the three potential investors reportedly are based offshore. Westbrook, a California-based firm involved in lumber, woodchips, and other ventures, has been considering the mill project since late 1987.

At first, a newsprint/thermomechanical pulp mill was proposed. Later, with planned newsprint capacity additions accumulating to over 2 million metric tons by 1991, the company decided to consider LWC paper. The mill is expected to employ about 300 people.

Klamath Falls, located at the headwaters of the Klamath River in south central Oregon, was chosen for several reasons, noted Burton Weast, president of Western Advocates Inc., an Oregon firm that represents Westbrook's interests. A regional wastewater treatment facility to be built at the mill would replace two nearby plants to solve local environmental concerns. This should expedite the permitting process, with both community and government authorities supporting the project.

Being in an enterprise zone, the mill will also qualify for property tax advantages that are expected to save about $8 million in the first five years of operation. The mill site is surrounded by large stands of available pulpwood (white fir, lodgepole, and ponderosa pine), and chip sources available within a 100-mile radius could supply the mill "several times over," the spokesman said. Other sites in Medford, Ore., and Montague, Calif., had also been considered during the one-year selection process. ■

Wastepaper use influencing pulp, paper chemical consumption

PULPING. Collection of wastepaper has been rising over the past decade, achieving a level above 25 million tons in 1988. The wastepaper utilization rate increased again to 27%. Old corrugated containers (OCC) leads in collection and utilization, but there is steady growth in newspaper and mixed and lagging growth in pulp substitutes and deinking stocks. Pricing for many grades is firm and exports are up. Many expansion plans for board mills and others are including secondary fiber systems.

Chemical suppliers have had a keen interest in these developments and have responded in kind to growing customer needs. On the pulping side, industry sources confirmed the renewed interest of the flotation and flotation/washing systems. Berol Chemicals, a pioneer in supplying a displector series to these systems, is seeing interest in its successful Berocell 204 product, a single formulation for combination systems—proven in systems accepting laser-ink-containing paper. Drew, also bullish in this market, is introducing two new deinking dispersants (Drewsperse 170 and 190).

Formulators are experiencing upward consumption trends and expect growth through industry production gains and increased concern on repulped fiber heading toward the paper machines. Berol said that they are working on an antiredeposition aid to boost brightness. Prices for products are not expected to shift appreciably in either direction, but most suppliers are tied to commodity chemicals that have had a recent history of fluctuation. One supplier also mentioned the tremendous interest in the southern and western markets.

The commodity side looks stable and is benefiting from industry growth. Silicate suppliers agree that overall levels are not as high as in the past, but good signs are all around. In recycling processes, smaller producers had used metasilicate but have switched to a liquid silicate product. The product is environmentally sound. Customers are establishing delivery requirements, particularly those in colder regions. For suppliers, markets in mechanical pulping look very bright. Prices for silicate products rose in fall 1988, an adjustment attributed to production costs such as formulators (silicate manufacturers also rely on alkali sources).

PAPERMAKING. The systems producing secondary fiber have created new productivity and runability concerns for papermakers. Although the mechanical end of deinking is sound and a portion of the latest purchased systems have included extra banks of cleaners, some carryover of contaminants is evident in forming and especially drying. Most of our respondents talked about the soaring interest in automatic and continuous washing systems for felts and wires, dispersants for stickies, microbial control, and other aids to control contaminants.

Suppliers are introducing products to help combat these problem furnish components. Betz Laboratories has seen wastepaper source changes affect stickies volume and control. The rising cost of high-quality secondary fiber is causing some mills, for example, to substitute OCC for preconsumer double-lined kraft (DLK). The challenge in making this switch is managing the hotmelt content in the OCC. Additives are available to do this.

PRODUCT OUTLOOK. In 1989, Betz plans on introducing a second-generation stickies detackification product for better control at lower treatment costs. Betz is also responding to source changes involving printed waste substitution of unprinted waste. This pulper deinking technique will be supported by a deinking agent that does not adversely affect sizing.

Drew is planning new products for felt washing (Drewclean 290) and microbiocides (Amerstat 445) as well as a new line of lower-cost/higher-activity defoamers. Buckman Laboratories is introducing Busperse 294 for controlling stickies and other pitch fixatives. Calgon mentioned that it is looking into new products to complement its formation and retention/drainage lines and has seen particular interest from linerboard producers. E.F. Houghton is also looking into expansions within its product lines.

No price activity is scheduled and availability is market. Sales are growing rapidly for suppliers who responded. Inquiries to various paper mills that use secondary fiber confirmed that these cleaners and conditioners are helping to extend production schedules and to hedge engineering shortfalls on the machines (such as felt storage and use, unfelted dryer sections, etc.).

On the business end, Berol is now operating under the Nobel Industries Paper Chemicals banner. No changes in products or services are foreseen. Calgon is expanding its geographical coverage of the paper industry, which will encompass all manufacturing points in North America.

—Michael Ducey

Wastepaper's popularity is growing in the U.S. (million tons).

	1980	1985	1988
Collection	17.9	19.6	25.2
Exports	2.66	3.28	4.80
Deinking	1.14	1.38	1.80
Utilization rate	23.8%	24.0%	25.0%
Furnish fraction	22.8%	23.6%	25.1%

Source: *Pulp & Paper Factbook.*

THE ECONOMICS ARE RIGHT FOR U.S. MILLS TO RECYCLE OLD NEWSPAPERS

More states are enacting mandatory collection and procurement laws to ease landfill crises, but they are ignoring market forces

By FRED D. IANNAZZI

Of the total U.S. solid-waste stream of 145 million metric tpy, paper and paperboard products comprise 64 million tons, or 40% of the total. By far, the two largest components of paper and board waste are old corrugated containers (OCC) and old newspapers (ONP). OCC, which is used to make the corrugating medium layer of corrugated containers, is actually in short supply. The recovery of OCC has risen from 44% to 50% over the past five years and is projected to rise even further in the next few years. Market forces alone will ensure that OCC will become a lessening burden in the waste stream.

ONP, however, is a different story. Only 32% of ONP is reused. That percentage has remained essentially unchanged for the past five years and shows no sign of increasing. Unrecovered ONP alone accounts for 15% of the paper and paperboard waste, or 6% of total U.S. solid waste. Since the recovery of ONP is not increasing as a result of market forces and since ONP is relatively easy to segregate at source (not in a mixed-solid-waste stream), many states and municipalities are enacting legislation that encourages or mandates greater recycling and reuse of ONP.

ONP GENERATION AND REUSE. The U.S. is by far the largest single consumer of newsprint, accounting for almost 41% of world consumption—about four times the usage of Japan, which is the second largest consumer. The U.S. is the only country in the world whose consumption of newsprint greatly exceeds its production. Only about 42% of the U.S. requirement is produced domestically.

Obviously, the U.S., as the world's largest consumer of newsprint, is also by far the largest generator of ONP and the largest potential market for ONP. The problem of ONP in the solid-waste stream on the scale encountered in the U.S. is unique to the U.S. Because of this vast tonnage, other countries' experiences in ONP recovery cannot necessarily serve as a model for the U.S.

Figure 1 shows the overall supply and disposition balance for newsprint in the U.S. in 1987. Starting in the center of the chart, we see that total U.S. consumption of newsprint was 12.3 million metric tons. Only 32% of this newsprint was recovered, and the remainder—about 8.4 million metric tons—ended up in the solid-waste stream.

The three markets for recovered ONP are newsprint manufacture, fiber furnish for other paper and board products, and export. We can assume that essentially all the export ONP is used to make newsprint, and, therefore, about half of the recovered ONP is recycled to newsprint.

There is little opportunity for increasing the reuse of ONP for nonnewsprint paper and board products; an ample supply of other grades of wastepaper better satisfies these applications. To increase the reuse of ONP significantly, we should encourage its increased use by newsprint mills in the U.S., keeping a few things in mind:

1. Only 24% of the fiber used in newsprint manufacture in the U.S. is recycled, and 76% is virgin fiber.
2. U.S. mills produce more than three times as much newsprint from virgin fiber as from ONP.
3. Fully 58% of total U.S. newsprint requirement is imported (almost all from Canada), despite the fact that a valuable low-cost resource—ONP—is burdening the U.S. with waste disposal problems and costs.

BARRIERS TO REUSE OF ONP. The supply of ONP is not a barrier to increased use. Existing supply channels could easily collect far more ONP than is presently collected if a viable market for it exists. In market terms, the volume of ONP recovered and recycled is *demand* limited, not *supply* limited. Legislation that mandates increased collection of ONP merely increases the supply; it does nothing to increase the demand. Unless demand is increased, any supply of segregated ONP will inevitably end up exactly where the unsegregated ONP does now—in landfills or incinerators.

Mr. Iannazzi is president, Andover International Associates, Danvers, Mass. *This article is based upon information contained in a multi-client study published by AIA. All tons in this article are metric.*

COMPARATIVE COSTS: ONP VS PULP. If it can be demonstrated that newsprint manufacture from ONP is economically attractive compared with virgin fiber and if the newsprint mills install the capacity to increase the demand for ONP, the supply of ONP could easily be increased 50%.

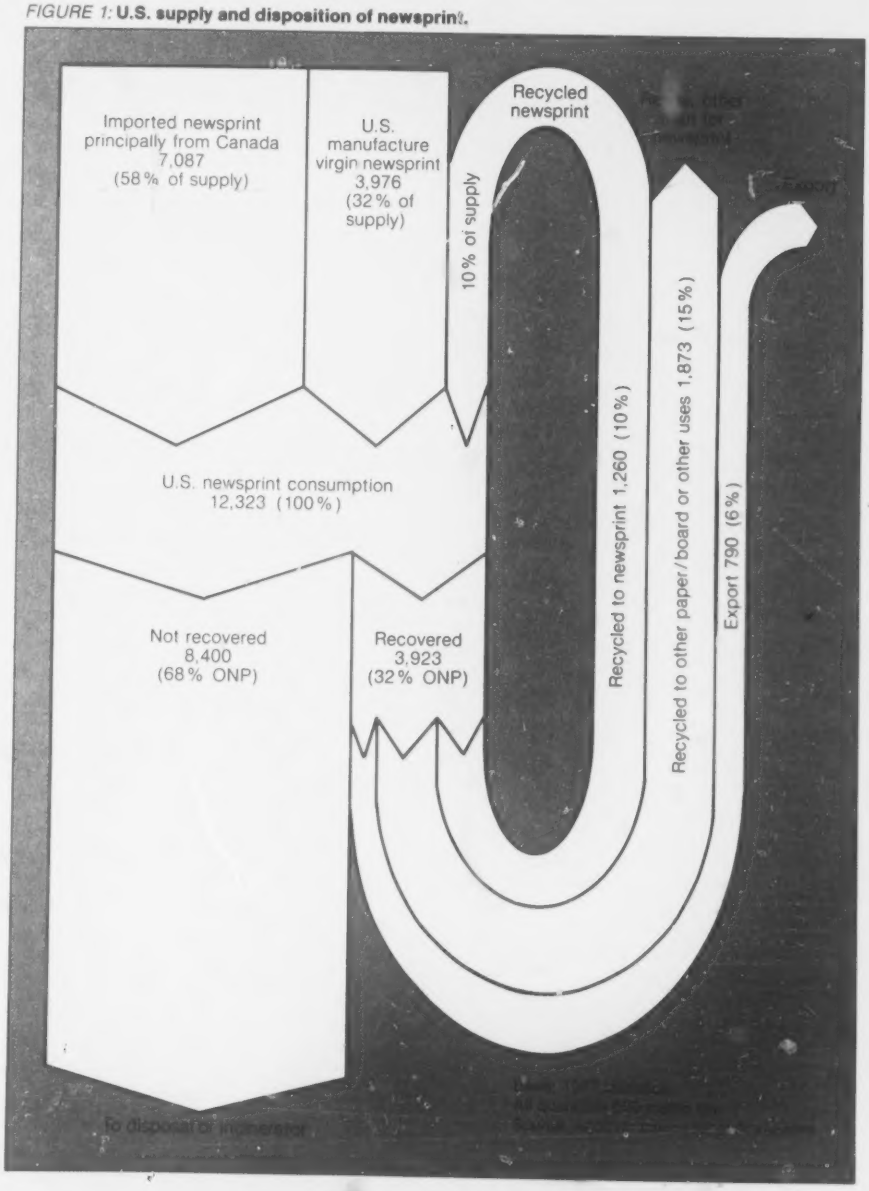
In the virgin fiber process, pulpwood is delivered to the mill as logs, the logs are debarked and chipped, and the chips are converted to pulp by cooking and mechanical defiberizing. Most integrated paper mills are, of necessity, closer to wood supplies than to urban areas.

Making newsprint out of clean and segregated ONP requires only deinking to produce slush pulp; the remainder of the process is similar to papermaking that starts directly from logs. It should be noted that in both processes, the product of the pulping stage is a very dilute slurry of pulp in water. It is uneconomic to dry and ship the pulp, so all U.S. newsprint mills are integrated. The virgin fiber process has a lower raw material cost but higher operating costs (particularly for power), and the process based on 100% ONP has a clear cost advantage (Table 1). However, the quality of newsprint made from 100% ONP is somewhat inferior to that produced using virgin fiber. This quality difference can be avoided by using ONP as a partial substitution rather than a 100% replacement for virgin fiber. Similar to the use of OCC as a blending fiber in manufacturing linerboard, ONP can be used to expand pulping facilities incrementally, without the costly burden of expanding wood handling and virgin fiber pulping capacity.

SUPPLY, DEMAND. Even with its cost advantages, the additional ONP pulp capacity that is slated to come online by 1991 in Dublin, Ga., totals only some 200,000 metric tpy. This is not even enough to compensate for the expected growth of about 1 million metric tpy in additional ONP that will be available by 1991. What is the problem?

The problem is that projected U.S. and Canadian installed pulping capacity for newsprint will exceed the projected demand by about 2 million metric tons, enough to preclude building significant new newsprint pulping capacity before 1992-93 at the earliest. Despite the fact that a new mill based on ONP would, under current conditions, be more economical than a virgin-fiber

FIGURE 1: **U.S. supply and disposition of newsprint.**


Imported newsprint principally from Canada 7,087 (58% of supply)
U.S. manufacture virgin newsprint 3,976 (32% of supply)
Recycled newsprint
10% of supply
U.S. newsprint consumption 12,323 (100%)
Not recovered 8,400 (68% ONP)
Recovered 3,923 (32% ONP)
Recycled to newsprint 1,260 (10%)
Recycled to other paper/board or other uses 1,873 (15%)
Export 790 (6%)

mill, it is decidedly uneconomic to shut down an existing virgin mill and replace it with a new ONP-based mill.

This situation will continue until more newsprint pulping capacity is needed, at which time the lower operating cost should tip the balance in the incremental capacity toward ONP-based mills. As with all generalizations, the above has numerous exceptions, particularly when we consider regional supply/demand balances (Table 2).

HOW TO INCREASE ONP USE. These are some suggestions on what will not work and what might be successful for increasing ONP use:

1. Simply imposing regulations to increase the supply of ONP without increasing the demand for ONP will not alleviate the burden of ONP in the solid-waste stream.

2. Imposing arbitrary targets for percent recovery of ONP and arbitrary timetables for achieving the targets will not create additional demand for ONP.

3. Setting up wastepaper collection and distribution systems in parallel or competition with the existing wastepaper dealers will not create any more demand for ONP and will cause confusion in the existing industry and market. The existing system will supply ONP to keep pace with any increase in demand, without the need for outside initiatives.

4. When establishing segregation and recycling ordinances, the advice of the potential user who must handle and market the product should be solicited to ensure that the regulations produce the highest possible quality of ONP for the newsprint mills.

5. Setting a minimum overall recycled content in the newsprint that is purchased for government use could be quite helpful in tilting new pulp lines toward ONP.

Although the current economics appear to favor ONP over virgin pulp as the fiber stock for newsprint, industry history, investment philosophy, and mill locations favor continuing with the traditional pulpwood feedstock. Legislative initiatives regarding investment, such as rapid depreciation or tax incentives for ONP pulping facilities, could be helpful.

Also, because of vast differences in the regional ONP supply/demand balances and in companies' ONP pulping capacities, flexible nationwide targets for ONP use would probably be more effective than regional targets or company targets. With national targets, it may be possible to permit intercompany bartering of "ONP utilization credits," i.e., a company that was using more than the target fraction of ONP in its newsprint could sell the excess credits to a company that was not in a position to use more ONP. In this way, the market would determine how the industry as a whole could best comply with the national target.

Building ONP pulping facilities requires about two years from project approval, but, in any case, there will be no need for additional newsprint pulping capacity in the U.S. before 1991. Any timetables for increased recovery/reuse of newsprint should be established with industry input so that they can be supported by the industry. ■

TABLE 1: **Operating cost comparison for newsprint manufacture.**

	Cost ($/metric ton)[1]	
	Virgin Pulp	100% ONP
Raw material	66	91
Power	157	66
Other process costs	164	158
Total cost newsprint	387	315

1. Not including investment-related costs.
Source: Andover International Associates.

TABLE 2: **Supply/demand of ONP in the U.S. (1987).**

Region	Newsprint consumption	ONP domestic use: Total	ONP domestic use: Newsprint manufacturing	Net ONP exports	Total ONP recovered	Recovery rate (%)
New England	746	139	0	0.3	139	19
Mid-Atlantic	2,414	634	241	83	717	30
East north central	1,908	669	122	0.6	670	35
West north central	678	54	0	0.5	54	8
South Atlantic	2,185	439	220	18	457	21[2]
East south central	409	76	0	0	76	18
West south central	1,216	328	0	204	332	27
Mountain and Pacific	2,761	810	592	457	1,067	46
Total U.S.	**12,323**	**3,220[3]**	**1,269**	**784**	**3,994[3]**	**32[3]**

1. Includes newsprint manufacture plus others (e.g., recycled board and tissue).
2. Garden State Paper Co, Inc. (Southeast Paper Manufacturing Co.) is installing a second newsprint machine at Dublin, Ga. The additional ONP demand (220,000 tpy) will increase the recovery rate to about 32%.
3. Includes 270,000 tpy used for insulation manufacture. This additional amount is not distributed on a regional basis by API.
Source: Andover International Associates.

U.S. LEADS THE WORLD IN PRODUCTION AND CONSUMPTION OF WASTEPAPER

Increasing recovery and reuse is expected to continue, but it will depend on many factors in addition to environmental pressures

By MATTI OLKINUORA

It probably does not surprise anyone that the U.S. is the world's largest source of wastepaper (recovery in 1986 was 20 million tons), followed by Japan (10 million tons) and Fed. Rep. Germany (4 to 5 million tons). These three countries are the leading consumers of paper, paperboard, and wastepaper in the world. In terms of recovery rate, included among the most efficient wastepaper collectors are countries such as Hong Kong (54%), Kuwait (53%), Japan (50%), and Taiwan (48%). In Europe, the Netherlands has a long tradition in wastepaper collection, with a high recovery rate of 46% (Table 1). Recycled fiber usage is driven by the following forces:

- Technical status, market requirements, and scale of the regional or local paper industry
- Trends in the levels of consumption of paper and paperboard
- Development trends in wastepaper collection, trade flows, and processing technologies and their impact on the availability of suitable recycled fiber in various markets
- Cost of recycled fiber compared with competing virgin fiber raw materials
- To some extent, growing ecological and environmental pressures.

Mr. Olkinuora is vice president-marketing research, Jaakko Pöyry Oy, Helsinki, Finland. This article originally appeared in the company's "Know-How Wire" publication.

CONSUMPTION AND UTILIZATION. Considerable regional differences exist in recycled fiber usage. The three leading consumers are the U.S. (16 million tons), Japan (11 million tons), and Fed. Rep. Germany (4 million tons), accounting for almost half of the world's total consumption (Table 2).

Recycled fiber's relative importance as a raw material of the paper industry is quite pronounced in the Asian and Latin American countries, which utilize an average of 40% to 46% of waste-based materials in their fiber furnish compared with, for example, North America's fairly modest 25%. In Western Europe, the average wastepaper proportions have traditionally been at an extremely low level (for example, Sweden at 11% and Finland at 4% [Figure 3]).

TABLE 1: **Wastepaper consumption vs paper and paperboard consumption, 1986.**

	Paper and paperboard consumption (million tons)	Wastepaper recovery (million tons)	Wastepaper recovery rate (%)
U.S.	71.6	19.6	27.4
Japan	21.0	10.5	50.0
Fed. Rep. Germany	10.5	4.5	42.9
People's Rep. China	10.9	2.1	19.3
U.S.S.R.	9.8	1.9	19.4
U.K.	8.4	2.4	28.6
France	7.2	2.1	29.2
Canada	5.6	1.1	19.6
Italy	5.2	1.1	26.9
Brazil	4.1	1.3	31.7
Others	49.3	16.0	32.5
World total	**203.6**	**62.9**	**30.9**

TABLE 2: **Wastepaper consumption vs paper and paperboard production, 1986.**

	Paper and paperboard consumption (million tons)	Wastepaper recovery (million tons)	Wastepaper utilization rate (%)
U.S.	65.0	16.3	25.1
Japan	21.1	10.7	50.7
Canada	15.1	1.5	9.9
U.S.S.R.	10.4	1.7	16.3
People's Rep. China	10.0	2.1	21.0
Fed. Rep. Germany	9.4	4.1	43.6
Finland	7.5	0.3	4.0
Sweden	7.4	0.8	10.8
France	6.5	2.0	35.7
Italy	4.6	2.0	43.5
Others	47.7	22.2	46.5
World total	**203.6**	**63.7**	**31.3**

Wastepaper suitable for recycling consist of various grades, excluding "disposable" grades, such as tissue paper, wallpaper, and cigarette paper. Books and documents tend to have a long life and rarely find their way to recycling. The best grades for recycling are mainly telephone directories, newspapers, magazines, printed advertising material, carton boards, and corrugated containers. Paper should be free of extras (envelope windows, samples attached, heavy gluing, etc.).

The most desirable raw materials are acquired from printing waste. Almost 100% of these products are recy-

FIGURE 1: **Total fiber consumption in paper and board production, 1986 (total fiber = 210 million tons).**

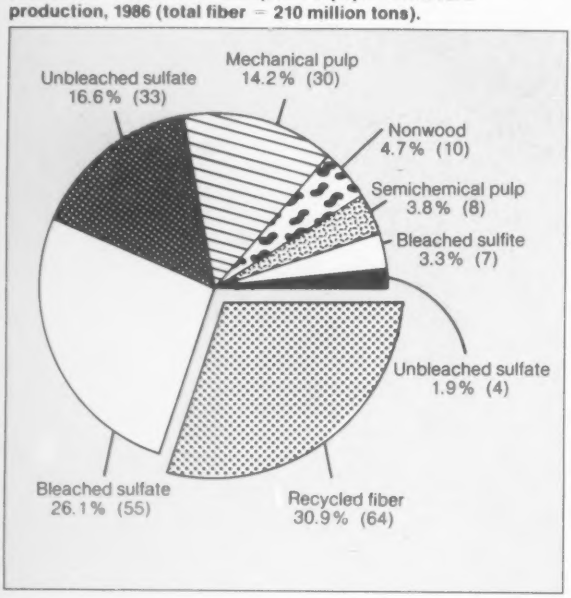


FIGURE 2: **Changes in world paper and paperboard furnish components, 1973-2000.**

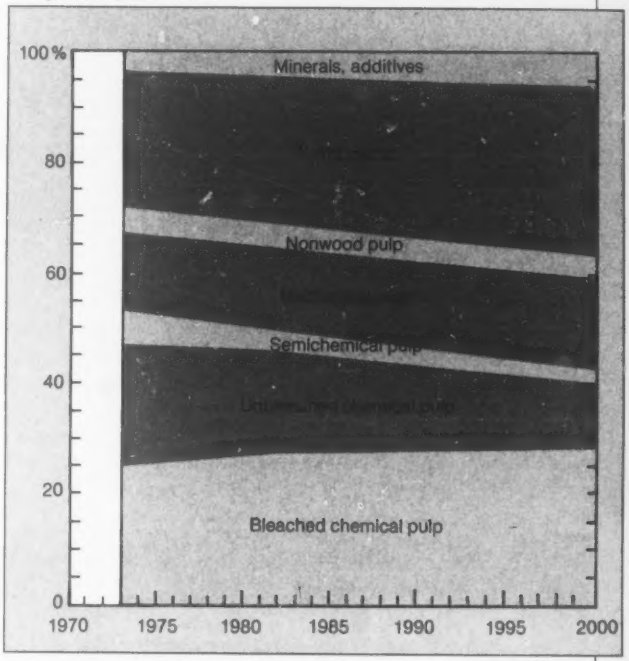
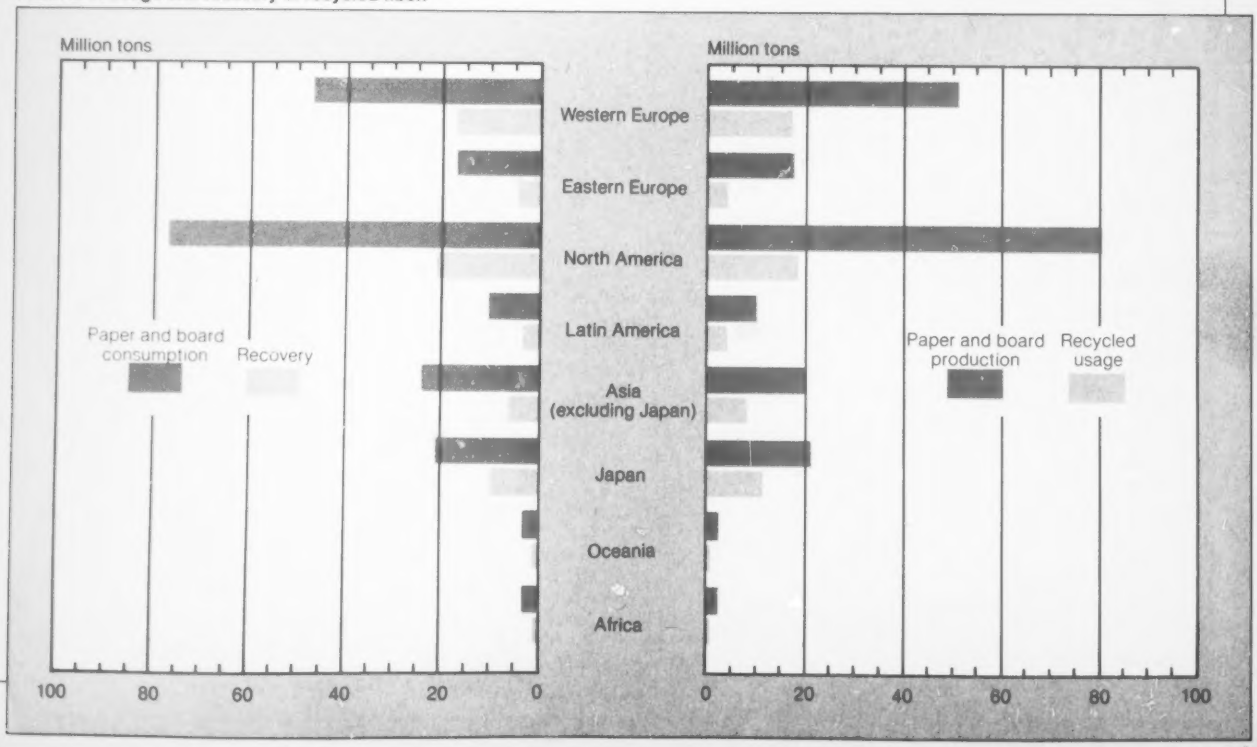


FIGURE 3: **Usage and recovery of recycled fiber.**



clable, contrary to, for example, household waste, of which over 15% is normally unusable. Other important sources of wastepaper supply are department stores, supermarkets and other enterprises, industrial units, converting plants, and offices. Wastepaper is generally classified and priced according to quality, starting with higher quality (white clippings, newspapers, magazines) and ending with brown paperboard grades and mixed unsorted waste.

WASTEPAPER AS A COMMODITY. Wastepaper has gradually become a marked international trade commodity too. Overall tonnage of wastepaper crossing country borders today exceeds 8 million tons. Almost half of this tonnage originates from the U.S. and is comprised mostly of old corrugated containers (OCC), telephone directories, etc. The world's main importing regions are Asia (more than 3 million tons) and Western Europe (3 million tons, mainly from regional sources).

WIDE RANGE OF END-USE APPLICATIONS. Unprocessed wastepaper has traditionally found its main end uses in the manufacture of lower-grade paper and paperboard products, mainly intended for various packaging or construction purposes. In addition to these products, sorted or deinked waste is currently used for many demanding end products, such as newsprint, printing and writing paper, tissue, packaging paper, various corrugated board raw materials, and carton boards.

The term "wastepaper" may give one the impression of something with inferior quality, but this is not the case with several recycled-fiber-based products meeting high international quality standards. Some newsprint mills are reportedly producing 100%-wastepaper-based newsprint. Printing and writing paper producers could also be using recycled fiber to a greater degree, but quality requirements are still so high that it is unlikely the share will increase notably. It is also doubtful that recycled fiber will gain more ground in the production of specialty grades such as security and telefax paper.

DEMAND FOR RECYCLED-FIBER-BASED PRODUCTS. It is safe to predict that the rapid average growth rate for consumption of recycled fiber will continue in the medium and long terms. This forecast is based on both past developments and increasing activity in product and process R&D. Therefore, the term "wastepaper-based product" may become even more misleading in the future. ■

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